UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,057	11/07/2001	Paul F. Christopher	16847.002	4818

7590 01/18/2007

Phillip G. Avruch
5136 Pelican Cove Drive
Boynton Beach, FL 33437

EXAMINER	
WANG, QUAN ZHEN	
ART UNIT	PAPER NUMBER
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/986,057	CHRISTOPHER, PAUL F.	
	Examiner	Art Unit	
	Quan-Zhen Wang	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-8,12-14,29-31 and 52-71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-8,12-14,29-31 and 52-71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 5-8, 12-14, 29-31, and 52-71 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 8 recite the limitation of "wherein said cloud water content is determined based on an empirical model for millimeter wave attenuation at zenith in said region." However, the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

Claim 29 recite the limitation of "said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said locations". However, the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

Claims 59, 64, and 69 recite the limitation of "said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in

said selected region". However, the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 5-8, 12-14, 29-31, and 52-71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 8 recite the limitation of "wherein said cloud water content is determined based on an empirical model for millimeter wave attenuation at zenith in said region." However, it is not clear what the recited limitation means because the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

Claim 29 recite the limitation of "said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said locations". However, it is not clear what the recited limitation means because the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

Claims 59, 64, and 69 recite the limitation of "said cloud water content being determined based on an empirical model for millimeter wave attenuation at zenith in said selected region". However, it is not clear what the recited limitation means

because the cloud water content is a natural existence. It is determined by the natural conditions on the earth, such as whether.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 7, 29, and 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) or Draim et al. (J. Draim et al., "Expanding global communications capacity using higher frequency bands with elliptical satellite constellations", 2000. IDS provided by Applicant) and further in view of Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759).

Regarding claims 1 and 29, as they are understood in view of the above 112 problem, Mendenhall teaches a satellite communication system comprising: a terrestrial base station (fig. 1B, 26); and a first satellite (fig. 1B, 10) communicating with said terrestrial base station using an infrared signal (optical beam, column 6, lines 63-64). Mendenhall further discloses that the satellite is an earth-orbiting satellite, which is inherently in inclined elliptical orbit, and is configured having an apogee at zenith for the terrestrial base station (as shown in fig. 1B). Mendenhall differs from the claimed

invention in that Mendenhall does not specifically teach that an optimal location of the terrestrial base station is determined based on a wavelength of the infrared signal and an attenuation of the infrared signal between the base station and the satellite at the wavelength, and the attenuation is determined based on a cloud water content for communication at zenith, persisting in a region in which the terrestrial base station is located. However, it is well known in the art that the attenuation of the non-rainy atmosphere is the dominating factor for ground-to-space optical satellite communication systems. For example, Badesha discloses that clouds, rain, and fog can scatter optical beam energy and disrupt communications (page 1, paragraph 0005, lines 8-10). Badesha further discloses that one approach to mitigate the problem is to have several ground stations at different locations so that a transmission can be sent from the ground station that is least obstructed (optimal location) by clouds (page 1, paragraph 0006). Likewise, Draim discloses to select an optimal location for the terrestrial station to minimize the attenuation of the optical signals (the entire article). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to select an optimal location of the terrestrial base station based on the minimal attenuation of the optical signals, which is a function of the wavelength of the infrared signal and the cloud water content for communication at zenith, persisting in a region in which the terrestrial base station is located, in order to provide a reliable communication capability. The modified system of Mendenhall and Badesha or Mendenhall and Draim differs from the claimed invention in that Mendenhall and Badesha or Mendenhall and Draim do not specifically teach to study the signal degradation caused by clouds using a

cloud water content model. However, it is well known in the art to study the signal degradation caused by clouds using a cloud water content model. For Example, Chu discloses to use cloud water content model (equations 9, and 12) to study the signal degradation caused by clouds. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply an empirical model, such as the one disclosed by Chu, to study the signal degradation caused by clouds in the modified system of Mendenhall and Badesha or Mendenhall and Draim in order to analyze the attenuation and influence of clouds on the satellite signals.

Regarding claim 7, since the attenuation is proportional to the distance of optical signal propagating in the atmosphere, the attenuation is also inherently determined by the probability function of an elevation angle to the satellite from the base station.

Regarding claim 52, it is obvious that the communicating occurs only when the satellite is in a portion of the elliptical orbit which is at or near the apogee.

Regarding claim 53, an elliptical orbit can be obviously at critical inclination.

7. Claims 5-6 are 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) and Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and further in view of Pfeiffer et al. (U.S. Patent US 5,960,097).

Regarding claims 5-6 are 30-31, it is inherent that a location of a terrestrial base station is defined by longitude and latitude. The modified system of Mendenhall,

Badesha, and Chu differs from the claimed invention in that Mendenhall, Badesha, and Chu do not specifically teach to determine the cloud water content based on an exceedance probability. However, exceedance probability is well known in the art and is widely used to analyze random systems. For Example, Pfeiffer discloses to use exceedance probability method to analyzing the influence of background clutter on a missile detection and tracking system (column 11, line 67 to column 12, line 2). The problem is analog to the signal degradation of the satellite communication system by water content in the clouds. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply the exceedance probability method taught by Pfeiffer for the cloud water content in the modified system of Mendenhall, Badesha, and Chu in order to analyze the influence of the clouds on the satellite signals.

8. Claims 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) and Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and further in view of Fletcher et al. (U.S. Patent US 4,025,783).

Regarding claims 54 and 58, the modified system of Mendenhall, Badesha, and Chu differs from the claimed invention in that Mendenhall, Badesha, and Chu do not specifically teach to determine the wavelength of the infrared signal is about 10 microns. However, it is well known in the art to use optical signals of about 10 microns

wavelength for free space communications. For example, Fletcher discloses to use optical signals of about 10 microns wavelength for free space communications (column 1, lines 22-27). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use 10 microns wavelength optical signal to carry information in the modified system of Mendenhall, Badesha, and Chu in order to reduce the signal attenuation by clouds.

9. Claims 8, 14, 55-56, 59-61, and 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) or Draim et al. (J. Draim et al., "Expanding global communications capacity using higher frequency bands with elliptical satellite constellations", 2000. IDS provided by Applicant) and Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and further in view of Ross et al. (U.S. Patent US 5,218,467).

Regarding claims 8, 59, and 64, as they are understood in view of the above 112 problem, Mendenhall, Badesha, Draim, and Chu have been discussed above in regard with claims 1 and 29. The modified system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu differs from the claimed invention in that Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu do not specifically disclose that the system further comprising a second satellite, a third satellite, a fourth satellite, and a fifth satellite, and the first satellite, second satellite, and third satellite each being in a phased Molniya orbit, and at least a fourth satellite and fifth satellite each being in a

geosynchronous orbit. However, Ross discloses a satellite communication system have a geosynchronous satellite (fig. 1, 1) communicating with six Molniya orbit satellites. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to include more than one geosynchronous satellites and plurality of Molniya orbit satellites in the modified satellite communication system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu in order to increase the area that the satellite communication system covers.

Regarding claim 14, since the attenuation is proportional to the distance of optical signal propagating in the atmosphere, the attenuation is also inherently determined by the probability function of an elevation angle to the satellite from the base station.

Regarding claim 55, it is obvious that the communicating occurs only when the satellite is in a portion of the Molniya orbit which is at or near the apogee.

Regarding claim 56, a Molniya orbit can be obvious at critical inclination.

Regarding claim 60 and 65, it is obvious that the communicating occurs only when the satellite is in a portion of the elliptical orbit which is at or near the apogee.

Regarding claim 61 and 66, an elliptical orbit can be obvious at critical inclination.

10. Claims 69 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) or Draim et al. (J. Draim et al., "Expanding global communications capacity using higher frequency bands with elliptical

satellite constellations", 2000. IDS provided by Applicant) and Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and further in view of Colella (N. Colella et al., "The HALO network", IEEE Communications Magazine, June 2000, pages 142-148).

Regarding claim 69, as it is understood in view of the above 112 problem, Mendenhall, Badesha, Draim, and Chu have been discussed above in regard with claims 1 and 29. The modified system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu differs from the claimed invention in that Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu do not specifically disclose that the system comprising aircraft flies at high altitude in a close path so as to be able to communicate continuously with the terrestrial base station. However, a communication system using a high altitude aircraft is well known in the art. For example, Colella discloses a communication network utilizing a high altitude aircraft (fig. 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a high altitude aircraft to replace the satellite in the modified satellite communication system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu in order to serve a metropolitan area with lower cost.

Regarding claim 71, the modified system of Mendenhall, Badesha, and Chu discloses to use cloud water content model (Chu, equations 9, and 12) to study the signal degradation caused by clouds.

11. Claims 12-13, 63, and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1), Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and Ross et al. (U.S. Patent US 5,218,467) and further in view of Pfeiffer et al. (U.S. Patent US 5,960,097).

Regarding claims 12, 63, and 68 the modified system of Mendenhall, Badesha, Chu, and Ross differs from the claimed invention in that Mendenhall, Badesha, Chu, and Ross differ do not specifically teach to determine the cloud water content based on an exceedance probability. However, exceedance probability is well known in the art and is widely used to analyze random systems. For Example, Pfeiffer discloses to use exceedance probability method to analyzing the influence of background clutter on a missile detection and tracking system (column 11, line 67 to column 12, line 2). The problem is analog to the signal degradation of the satellite communication system by water content in the clouds. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply the exceedance probability method taught by Pfeiffer to the modified system of Mendenhall, Badesha, Chu, and Ross in order to analyze the influence of the clouds on the satellite signals.

Regarding claim 13, the modified system of Mendenhall, Badesha, and Chu discloses to use cloud water content model (Chu, equations 9, and 12) to study the signal degradation caused by clouds.

12. Claims 57, 62, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1), Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and Ross et al. (U.S. Patent US 5,218,467) and further in view of Fletcher et al. (U.S. Patent US 4,025,783).

Regarding claim 57, 62, and 67, the modified system of Mendenhall, Badesha, Chu, and Ross differs from the claimed invention in that Mendenhall, Badesha, Chu, and Ross do not specifically teach to determine the wavelength of the infrared signal is about 10 microns. However, it is well known in the art to use optical signals of about 10 microns wavelength for free space communications. For example, Fletcher discloses to use optical signals of about 10 microns wavelength for free space communications (column 1, lines 22-27). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use 10 microns wavelength optical signal to carry information in the modified system of Mendenhall, Badesha, Chu, and Ross in order to reduce the signal attenuation by clouds.

13. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1), Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759) and Colella

(N. Colella et al., "The HALO network", IEEE Communications Magazine, June 2000, pages 142-148) and further in view of Fletcher et al. (U.S. Patent US 4,025,783).

Regarding claim 70, the modified system of Mendenhall, Badesha, Chu, and Colella differs from the claimed invention in that Mendenhall, Badesha, Chu, and Colella do not specifically teach to determine the wavelength of the infrared signal is about 10 microns. However, it is well known in the art to use optical signals of about 10 microns wavelength for free space communications. For example, Fletcher discloses to use optical signals of about 10 microns wavelength for free space communications (column 1, lines 22-27). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use 10 microns wavelength optical signal to carry information in the modified system of Mendenhall, Badesha, Chu, and Colella in order to reduce the signal attenuation by clouds.

Response to Arguments

14. Applicant's arguments filed on October 16, 2006 have been considered but are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In addition, Applicant argues that the signal wavelength in the system of Mendenhall is 1.554 microns and Mendenhall fails to teach the advantageous use of longer wavelength signals in the infrared spectrum, as required by all of the independent claims, including claims 1 and 29. However, the argued terminology is not reflected in the claims. For example, claims 1 and 29 only recite "... using an infrared signal ...". Since signal at 1.554 micron is "an infrared signal", the disclosed signal at 1.554 microns in the system of Mendenhall reads on the claimed "using an infrared signal". In addition, using any wavelength between visible light and S-band would be within the level of ordinary skill in the art.

Applicant argues that Badesha is not directly relevant to the current application. However, Badesha is cited to show that the attenuation of the non rainy atmosphere is the dominating factor for ground-to-space optical satellite communication systems. Likewise, Draim is cited to show that the attenuation of the non rainy atmosphere is the dominating factor for ground-to-space optical satellite communication systems. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to select an optimal location of the terrestrial base station based on the minimal attenuation of the optical signals, which is a function of the wavelength of the infrared signal and the cloud water content for communication at zenith, persisting in a region in which the terrestrial base station is located, in order to provide a reliable communication capability.

Applicant argues that the results in Chu, which relate attenuation to water vapor density, are limited to terrestrial communications where the water vapor density of

ground fog can be quantified. However, **Applicant also admits**, "For determining the attenuation of infrared signals in satellite communications applications due to cloud cover, the present invention utilizes the empirical models for atmospheric attenuation at millimeter wave frequencies (22.2 and 49.5 GHz) reported in Barbaliscia et al. (cited above), to derive a general expression for cloud water content for communication at zenith (see application Figure 7 and discussion at page 14, line 12 through page 16, line 17). Combining these new results with Chu and Hogg allows cloud attenuation at infrared wavelengths to be determined for the purposes of selecting an optimal location for a terrestrial base station." Please note that the rejections are based on combination of references.

Applicant argues that Ross differs from the claimed Molniya orbits and the satellites in Ross communicate in RF. However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In addition, Molniya orbits are relatively a broad term in describing the orbits of satellites which reads on the low earth orbits of Ross. Furthermore, satellite in Molniya orbits are well known in the art and set the satellites in Ross to Molniya orbits would be within the level of ordinary skill in the art.

Applicant argues that HALO system disclosed in Colella operates at millimeter wave frequencies. However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. For the instant case, the modified system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu discloses an infrared satellite communication system. Colella discloses

a communication network utilizing a high altitude aircraft (fig. 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a high altitude aircraft to replace the satellite in the modified satellite communication system of Mendenhall Badesha, and Chu or Mendenhall, Draim and Chu in order to serve a metropolitan area with lower cost.

Applicant's arguments filed on October 16, 2006 have been considered but are moot in view of the new ground rejections.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wilson et al. (K. Wilson et al., "Optical communications for deep space missions", IEEE communication Magazine, August 2000, IDS provided by Applicant) discloses an optical communication system for deep space communications.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

qzw
1/9/2007

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600